

WHAT IS CLAIMED IS:

1. A stage unit comprising:

a substrate holding member which holds a substrate; and

5 a substrate stage which moves two dimensionally with said substrate holding member mounted, and on which a plurality of fiducial marks are arranged dispersed by each measurement sequence which uses said fiducial marks with a positional relationship between each of said fiducial marks and said
10 substrate holding member constant.

2. The stage unit according to Claim 1, wherein said plurality of fiducial marks are at least three fiducial marks respectively arranged in the vicinity of each vertex position
15 of a polygon which contains a center of said substrate holding member.

3. The stage unit according to Claim 1, wherein said plurality of fiducial marks include a first fiducial mark and
20 a second fiducial mark, which are arranged on a straight line passing through a center of said substrate holding member on opposite sides with respect to said center.

4. The stage unit according to Claim 1, said stage unit
25 further comprising:

a plurality of fiducial mark plates arranged on a periphery of said substrate holding member on said substrate stage, on which at least one of said fiducial marks is

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respectively formed.

5. An exposure apparatus which exposes a substrate with an energy beam and forms a predetermined pattern on said substrate, said exposure apparatus comprising:

a substrate stage that moves two-dimensionally;

a substrate holding member mounted on said substrate stage that holds said substrate;

a plurality of fiducial mark plates on which a plurality of fiducial marks are dispersedly arranged by each measurement sequence which uses said fiducial marks, and are arranged on a periphery of said substrate holding member on said substrate stage with a positional relationship between each of said fiducial marks and said substrate holding member constant;

a mark detection system which detects marks located on said substrate stage; and

a control unit, which performs various types of measurement sequences respectively including a detection operation to detect at least one of said plurality of fiducial marks using said mark detection system.

6. The exposure apparatus according to Claim 5, said exposure apparatus further comprising:

a position measurement unit that controls a position of said substrate stage based on an orthogonal coordinate system, and wherein

said plurality of fiducial mark plates include

a first mark plate on which a plurality of fiducial

marks are arranged along a first axis direction of said orthogonal axis, said first mark plate narrowly extending in said first axis direction, and

a second mark plate on which a plurality of fiducial marks are arranged along a second axis direction orthogonal to said first axis, said second mark plate narrowly extending in said second axis direction.

7. The exposure apparatus according to Claim 6, said exposure apparatus further comprising:

a mask stage that holds a mask on which said pattern is formed;

a drive unit which synchronously moves said mask stage and said substrate stage along said second axis direction; and

a pair of mark detection systems for masks that measure at least one pair of mask marks formed on both sides of said pattern on said mask in said first axis direction, wherein

a length of said first mark plate in said first axis direction almost corresponds to a distance between said pair of mask marks, and a length of said first mark plate in said second axis direction is slightly longer than a length required to form said fiducial mark.

8. The exposure apparatus according to Claim 6, said exposure apparatus further comprising:

a mask stage that holds a mask on which said pattern is

formed;

a drive unit that synchronously moves said mask stage and said substrate stage along said second axis direction;

a mask side position measurement unit which measures a position of said mask stage; and

a mark detection system for masks which measures a plurality of pairs of mask marks formed on both sides of said pattern on said mask in said first axis direction, wherein

a length of said second mark plate in said second axis direction almost corresponds to a length of said pattern in said second axis direction, and a length of said second mark plate in said first axis direction is slightly longer than a length required to form said fiducial mark.

9. An exposure apparatus which exposes a substrate with an energy beam and forms a predetermined pattern on said substrate, said exposure apparatus comprising:

a substrate stage that moves two-dimensionally;

a position measurement unit that measures a position of said substrate stage;

a substrate holding member mounted on said substrate stage that holds said substrate;

at least three fiducial marks that are respectively arranged in the vicinity of each vertex position of a polygon that contains a center of said substrate holding member, and are arranged on said substrate stage with a positional relationship between each of said fiducial marks and said substrate holding member constant;

a mark detection system which detects marks located on said substrate stage including said fiducial marks; and

a control unit that performs various types of measurement sequences respectively including a detection operation to detect either of one and a plurality of said at least three fiducial marks using said mark detection system and said position measurement unit.

10. The exposure apparatus according to Claim 9, said exposure apparatus further comprising:

a plurality of fiducial mark plates on which at least one of said fiducial marks is respectively formed, said fiducial mark plates arranged on a periphery of said substrate holding member on said substrate stage.

11. The exposure apparatus according to Claim 10, wherein said at least three fiducial marks are arranged on said plurality of fiducial mark plates, dispersed by each measurement sequence which uses at least one of said fiducial marks.

12. The exposure apparatus according to Claim 11, wherein

a position of said substrate stage is controlled with said position measurement unit based on an orthogonal coordinate system, and

said plurality of fiducial mark plates include

a first mark plate on which a plurality of fiducial

marks are arranged along a first axis direction of said orthogonal axis, said first mark plate narrowly extending in said first axis direction, and

a second mark plate on which a plurality of fiducial marks are arranged along a second axis direction orthogonal to said first axis, said second mark plate narrowly extending in said second axis direction.

13. The exposure apparatus according to Claim 9, wherein said at least three fiducial marks are respectively formed on said substrate holding member.

14. An exposure apparatus which exposes a substrate with an energy beam and forms a predetermined pattern on said substrate, said exposure apparatus comprising:

a substrate stage that moves two-dimensionally;

a position measurement unit that measures a position of said substrate stage;

a substrate holding member mounted on said substrate stage that holds said substrate;

at least two fiducial marks including a first fiducial mark and a second fiducial mark which are arranged on a straight line passing through a center of said substrate holding member on opposite sides with respect to said center, and are arranged on said substrate stage with a positional relationship between each of said fiducial marks and said substrate holding member constant;

a mark detection system which detects marks located on said substrate stage including said at least two fiducial marks; and

5 a control unit that performs various types of measurement sequences respectively including a detection operation to detect either of one and a plurality of said at least two fiducial marks using said mark detection system and said position measurement unit.

10 15. The exposure apparatus according to Claim 14, said exposure apparatus further comprising:

15 a plurality of fiducial mark plates arranged on a periphery of said substrate holding member on said substrate stage, on which one of said at least two fiducial marks is respectively formed.

16. The exposure apparatus according to Claim 15, wherein

20 said at least two fiducial marks are arranged on said plurality of fiducial mark plates, dispersed by each measurement sequence which uses any one of said fiducial marks.

17. The exposure apparatus according to Claim 16, wherein

25 a position of said substrate stage is controlled with said position measurement unit based on an orthogonal coordinate system, and

said plurality of fiducial mark plates include

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a first mark plate on which a plurality of fiducial marks including said first fiducial mark are arranged along a first axis direction of said orthogonal axis, said first mark plate narrowly extending in said first axis direction, and

a second mark plate on which a plurality of fiducial marks, including said second fiducial mark are arranged along a second axis direction orthogonal to said first axis, said second mark plate narrowly extending in said second axis direction.

18. The exposure apparatus according to Claim 14, wherein said at least two fiducial marks are respectively formed on said substrate holding member.

19. The exposure apparatus according to Claim 14, wherein

a position of said substrate stage is controlled with said position measurement unit based on an orthogonal coordinate system, and

said straight line connecting said first fiducial mark and said second fiducial mark is tilted at an angle of approximately 45° with respect to both coordinate axes of said orthogonal coordinate system.